

SUPPLEMENTARY MATERIAL FOR

“*Candidatus Dechloromonas phosphoritropha*” and “*Ca. D. phosphorivorans*”, novel polyphosphate accumulating organisms abundant in wastewater treatment systems

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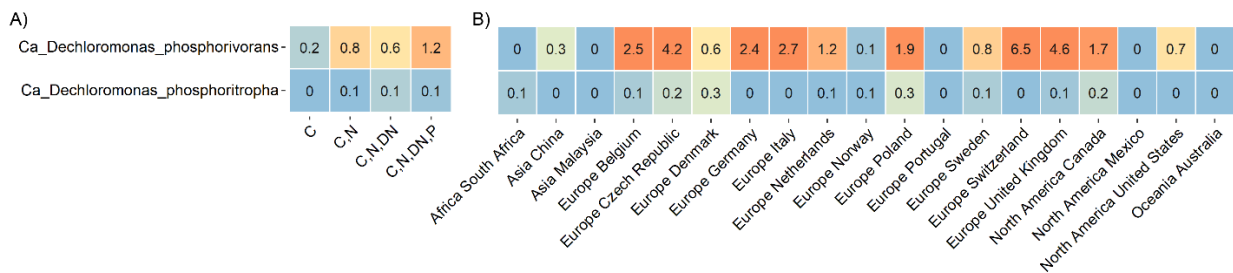


Figure 1. Average relative read abundance of *Ca. Dechloromonas phosphorivorans* and *Ca. Dechloromonas phosphoritropha* across A) different process configurations (N plants = 480; C - carbon removal; C,N - carbon removal and nitrification; C,N,DN - carbon and nitrogen removal; C,N, DN - carbon, nitrogen and phosphorus removal), and B) across the world in EBPR (C,N,DN,P) plants (N plants = 111). Data comes from the global MiDAS survey of microbial communities in WWTPs (Dueholm et al., 2021).

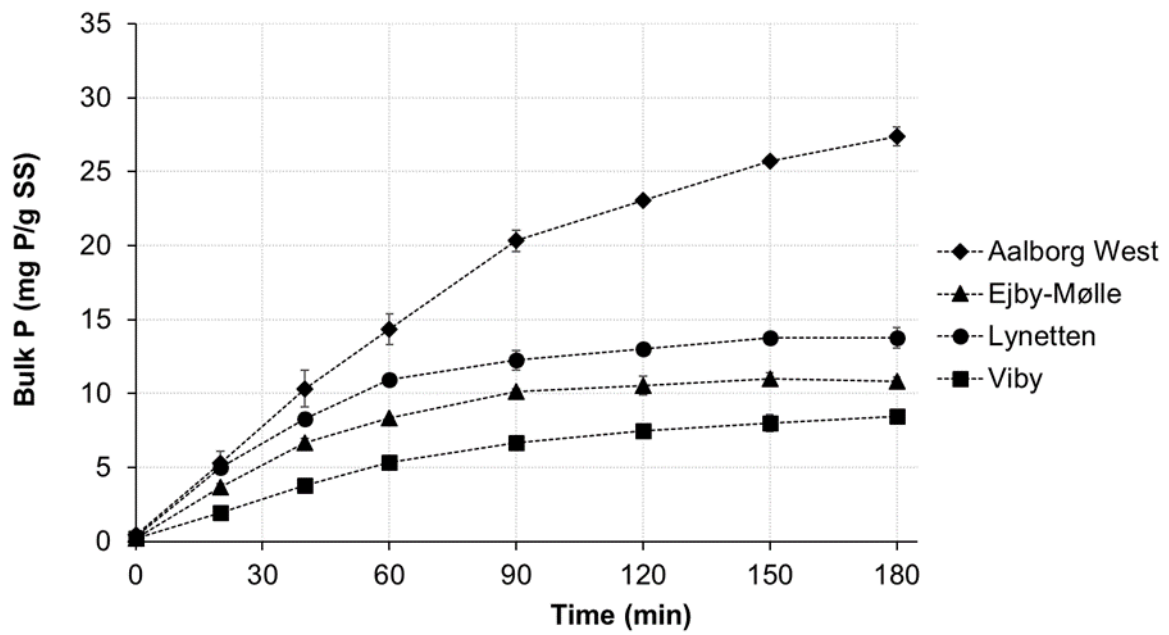


Figure 2. Anaerobic phosphate release profiles from 4 full-scale EBPR plant activated sludge samples, amended with a mixture of acetate, glucose, and casamino acids with a final concentration of 500, 250, and 250 mg L⁻¹, respectively.

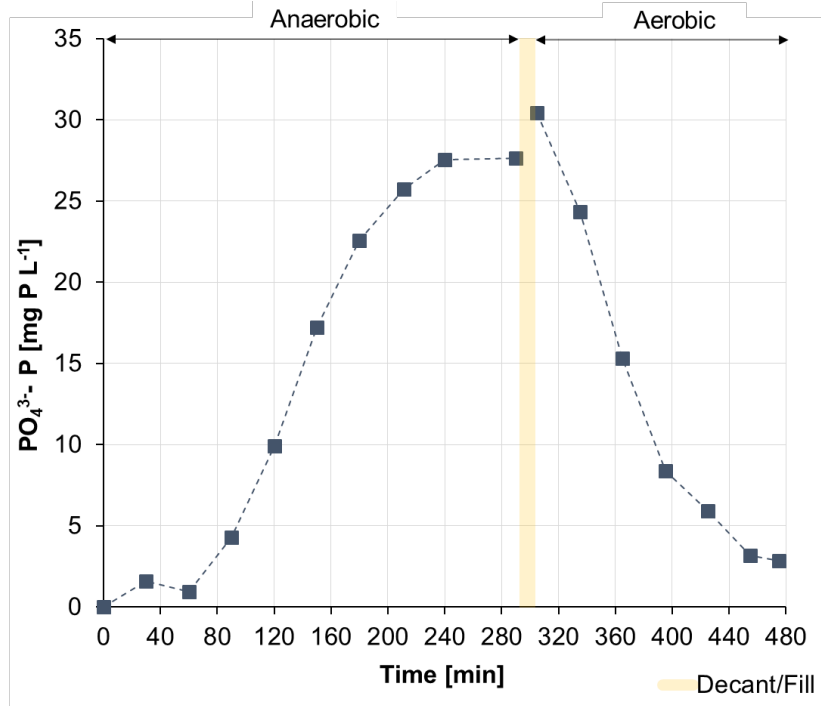


Figure 3. Phosphate release and phosphate uptake from SBR biomass containing PAOs during an operational cycle. The substrate added under anaerobic conditions was casein hydrolysate at an initial concentration of 200 mg COD L⁻¹

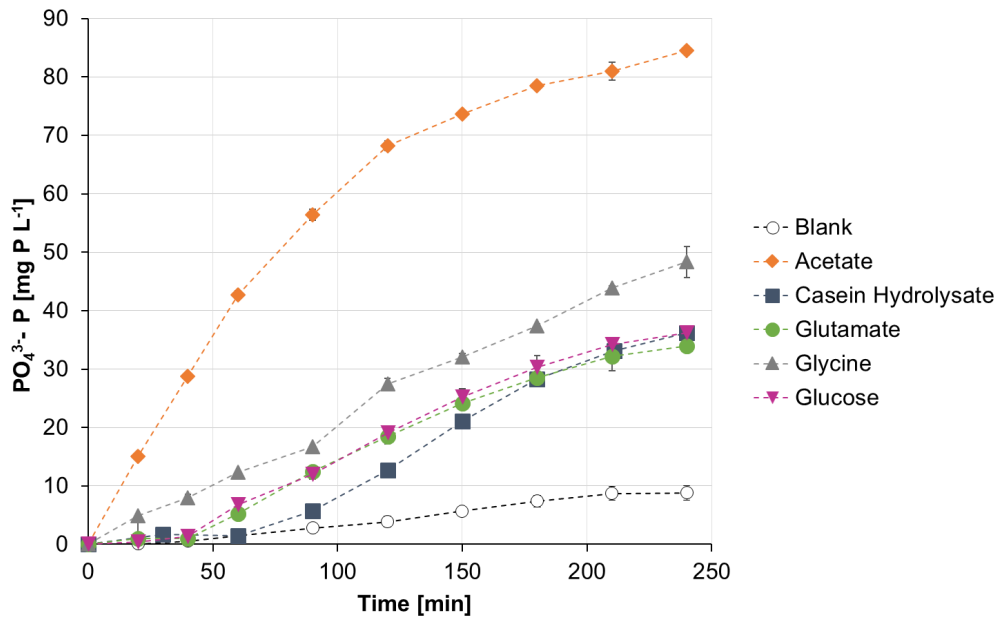


Figure 4. Anaerobic phosphate release profiles obtained with different carbon sources with an initial cycle concentration of 200 mg COD L⁻¹ from SBR biomass containing PAOs, including *Dechloromonas*.

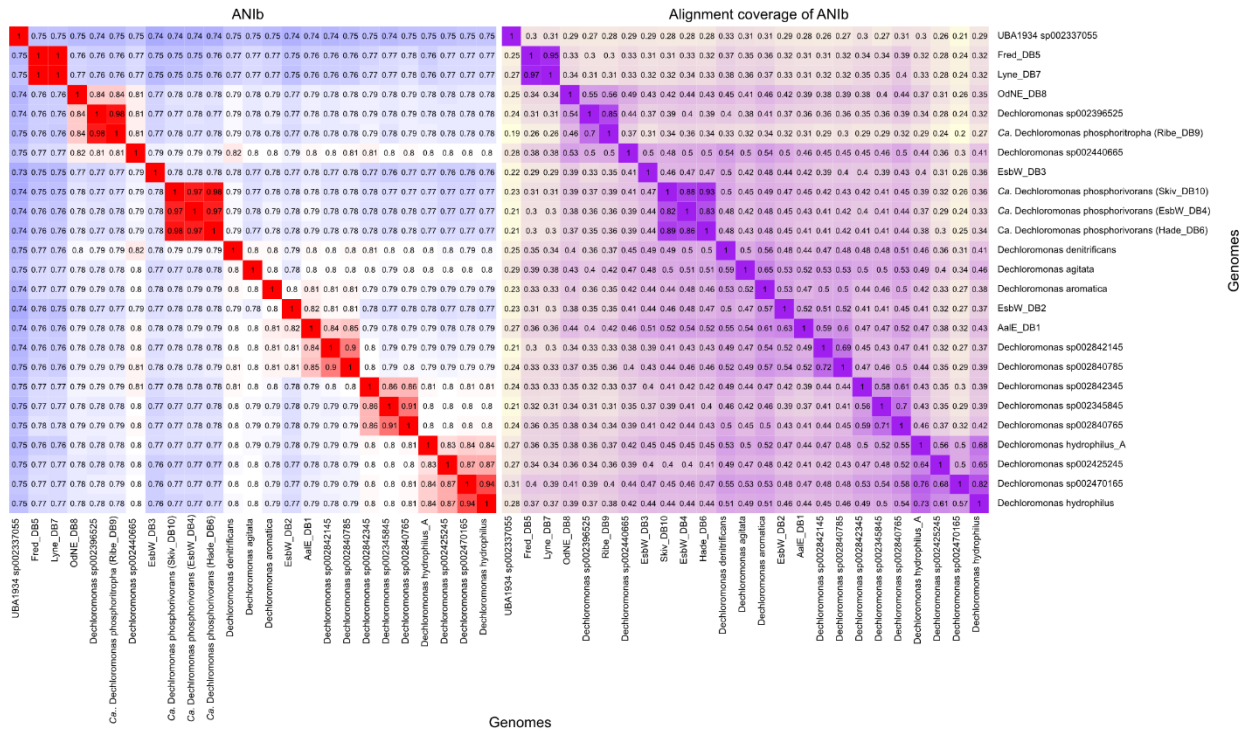


Figure 5. Average nucleotide identity (%) using BLASTN+ (ANIB) and alignment coverage (%) of the genomes and MAGs in Figure 5. The genomes are ordered by the genome tree in Figure 5.

SDataFile 1. 100% complete KO modules identified using EnrichM

SDataFile 2. 16S rRNA genes used for record of provisional taxon for *Ca. Dechloromonas phosphoritropha* and *Ca. Dechloromonas phosphorivorans*.

STable 1. KO annotations for the MAGs and gene acronyms used throughout the manuscript.

STable 2. Complete protologues for inclusion in the codified record of provisional taxon for *Candidatus* Dechloromonas phosphoritropha and *Candidatus* Dechloromonas phosphorivorans.

Taxonumber	N/A	N/A
Species name	<i>Candidatus</i> Dechloromonas phosphoritropha	<i>Candidatus</i> Dechloromonas phosphorivorans
Genus name	<i>Dechloromonas</i>	<i>Dechloromonas</i>
Specific epithet	phosphoritropha	phosphorivorans
Type species of the genus	<i>Dechloromonas agitata</i> strain CKB	<i>Dechloromonas agitata</i> strain CKB
Taxonumber of the type species	73030	73030
Genus status	Validly published	Validly published
Species etymology	phos.pho.ri,tro'pha. from N. L. masc. N. <i>phosphorus</i> , phosphorus; Gr. Masc. n. <i>trophos</i> , one who feeds; N. L. fem. adj. <i>phosphoritropha</i> , indicating the ability to accumulate poly-phosphate	phos.pho.ri.vo'.rans, from N.L. masc. n. <i>phosphorus</i> , phosphorus; L. pres. part. <i>vorans</i> , devouring; N.L. part adj. <i>phosphorivorans</i> , indicating the ability to accumulate poly-phosphate
Species status	sp. nov.	sp. nov.
Designation of the type MAG	GCA_016722705.1	GCA_016721185.1
MAG/SAG accession number	GCA_016722705.1	GCA_016721185.1
Genome status	High-quality draft	High-quality draft
Genome size	4,726,453	4,220,355
GC mol %	61.9	60.8
Country of origin	Denmark	Denmark
Region of origin	Ribe	Skive
Source of sample	Full-scale biological nutrient removal wastewater treatment plant	Full-scale biological nutrient removal wastewater treatment plant
Geographical location	Ribe	Skive
Latitude	55.3269° N	56.5651° N
Longitude	8.7747° E	9.0309° E
Depth	N/A	N/A
Altitude	N/A	N/A
Temperature of the sample [In celcius degrees]	Mesophilic	Mesophilic
pH of the sample	N/A	N/A
Relationship to oxygen	Facultative anaerobe	Facultative anaerobe
Energy metabolism	Potentially utilizing acetate and amino acids	Potentially utilizing acetate and amino acids
Assembly	1 sample	1 sample
Sequencing technology	Oxford Nanopore and Illumina Hiseq X	Oxford Nanopore and Illumina Hiseq X
Binning software used	Maxbin v2.2.7	Maxbin v2.2.7
Assembly software used	CANU v1.8	CANU v1.8
Habitat	Full-scale biological nutrient removal wastewater treatment plant	Full-scale biological nutrient removal wastewater treatment plant
Miscellaneous, extraordinary features relevant for the description	Rod-shaped often arranged in spherical microcolonies	Rod-shaped often arranged in spherical microcolonies

References

Dueholm, M.S., Nierychlo, M., Andersen, K.S., Rudkjøbing, V., Knudsen, S., the MiDAS Global Consortium, Albertsen, M., Nielsen, P. H. (2021): MiDAS 4 - a global WWTP ecosystem-specific full-length 16S rRNA gene catalogue and taxonomy for studies of bacterial communities. *BioRxiv*.